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The Genus *Psorthaspis* on the Mexican Central Plateau (Hymenoptera, Pompilidae)

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The genus *Psorthaspis* contains approximately 40 known species, which together range from the southern United States south to the Greater Antilles and to Colombia. One species (*planata* Fox) is known to prey upon trap-door spiders (Ctenizidae) and, judging from the structural specializations of the head and prothorax of the females, it seems probable that all the species prey upon these spiders or at least on some type of burrowing spider. The range of the genus, in North America at least, corresponds closely with that of the Ctenizidae, and areas of abundance of trap-door spiders are usually places of relative abundance of *Psorthaspis*. The genus was revised by Bradley in 1944 (Trans. Amer. Ent. Soc., vol. 70, pp. 32-79). Making use of much of the material then available in museums, Bradley accurately defined the genus for the first time and presented keys, descriptions, and distributional data for all the known species. Bradley pointed out that the center of distribution of this genus is clearly in Mexico, but a perusal of his distributional data reveals that only 12 Mexican specimens were then available for examination, several of these without further locality data. Hence the considerable amount of *Psorthaspis* material from Mexico which has recently become available is of considerable interest.

The specimens upon which this report is based are largely from two sources. The 1947 David Rockefeller Expedition of the American Museum of Natural History collected a considerable number of specimens of *Psorthaspis* in Chihuahua and Durango.² During the summer of 1951 the present writer and Dr. Paul D. Hurd, Jr., collected *Psorthaspis* in

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² This expedition has been described by Herman T. Spieth in American Museum Novitates, no. 1454, 1950.

Nuevo Leon, Chihuahua, Durango, Zacatecas, Jalisco, and Morelos.¹ A few additional specimens from other sources were also studied. All of this material is from the Nearctic parts of Mexico and makes it possible to fill in a number of gaps in our knowledge of this genus. There are several species of *Psorthaspis* which occur in southern Mexico which were not included in this material. It is hoped that more material from Neotropical Mexico and Central America (and, in fact, from all parts of the range of *Psorthaspis*) may someday be made available, making possible a comprehensive review of this very interesting genus of spider wasps.

Bradley divided *Psorthaspis* into 10 species groups. Most of these appear to represent natural phyletic stocks, although certain of them should probably be combined. However, Bradley's species group 1, *morosa*, appears to me to be a heterogeneous assemblage, containing elements that should be distributed among at least three of the other species groups. After some rearrangement of the species, the *Psorthaspis* of the Mexican Central Plateau may be said to fall within three species groups, here called the *laevifrons*, *macronotum*, and *planata* groups. These are considered in turn, and keys are presented at the end. I regard *P. vicina* (Cresson) as most primitive in the genus; the three groups considered here appear to represent stocks that have evolved independently in different directions from the prototype.

The terminology used below is the same as that employed in the writer's study of the Nearctic Pompilini (1950, Trans. Amer. Ent. Soc., vol. 75, pp. 137-141) except for two additional terms. The more or less elevated ridge between the antennal sockets formed by the upper median portion of the clypeus and the lower median portion of the front is here termed the clypeo-frontal bridge. An imaginary line drawn from one posterior ocellus to the crest of the vertex is termed the ocello-vertical line.

Psorthaspis laevifrons SPECIES GROUP

The claws of the female in this group are unlike those of any other *Psorthaspis*; the outer ray is curved in such a way as to be nearly parallel to the large inner ray (fig. 4). The vertex of the female is not much extended above the eye tops (somewhat so in *bradleyi*, new species); the ultimate tarsal segments are not spined beneath (except in *coelestis*); the clypeo-frontal bridge is narrow or much reduced; the propodeum is coarsely rugose. The male is known only in the case of

¹ This trip was made possible to the two participants by grants-in-aid from the Penrose Fund of the American Philosophical Society (Evans) and from the Associates in Tropical Biogeography of the University of California (Hurd).

bradleyi; this species has all the claws bifid (fig. 5) and the subgenital plate narrow, elongate, and without lateral teeth (fig. 1).

This group contains *laevifrons* Cresson (southern Mexico to Costa Rica), *guatemalae* Bradley (Guatemala), *coelestis* Bradley (Costa Rica), *columbiae* Bradley (Columbia), *eubule* Cameron (southern Mexico), and *bradleyi*, new species (west central Mexico). The first four of these were placed by Bradley in the *morosa* species group, but they appear to me to have little in common with *morosa*. *Psorthaspis telemon* Cameron is probably a synonym of *laevifrons*, as suggested by Bradley.

Psorthaspis eubule (Cameron)

Pompilus eubule CAMERON, 1893, Biologia Centrali-Americana, Hymenoptera, vol. 2, p. 187, pl. 11, figs. 8, 8a.

Cameron's description of this species is extremely poor, and Bradley listed it as unrecognizable. Mr. I. H. H. Yarrow of the British Museum (Natural History) has recently examined the type for me and sent me notes on its structure. The species clearly belongs to this group and is related to *laevifrons*, from which it differs by having the clypeus rounded apically and the clypeo-frontal bridge of moderate breadth and not at all depressed. The only known specimen is the type female, from Amula, Guerrero, 6000 feet elevation. Cameron originally recorded it also from Ventanas, Durango, but this specimen is not now present in the British Museum.

Psorthaspis bradleyi, new species

This species differs from other members of its group by having the vertex of the female somewhat extended above the eye tops and the hind ocelli well removed from the vertex crest; the front is broader than in any related species; the clypeus is rounded apically as in *eubule*. It is the only member of the group of which the male is known. It seems fitting that this species, the largest in the genus save for *coelestis*, be named for Dr. J. C. Bradley in recognition of his valuable revisionary studies of *Psorthaspis*.

FEMALE: Length, 22 mm.; forewing, 17 mm. Integument entirely black; wings wholly infuscated; body and wings clothed with a brilliant purple pubescence which grades into bluish on the legs, apex of the abdomen, and wing veins. Temples, propleura, and front coxae with numerous dark hairs; front, vertex, and entire thorax and propodeum, including the legs to the femora, with a thin covering of shorter setae.

Transfacial distance 1.05 times the facial distance. Clypeus 1.4 times as broad as high, its apical margin evenly convex. Clypeo-frontal bridge

not at all depressed; bridge narrow, constricted, and round-topped at the level of the bottoms of the antennal sockets. Front with a median impression just above the antennal sockets and shallow impressions dorso-laterad of each hind ocellus. Middle interocular distance 0.7 of the transfacial distance, 1.2 times the lower interocular distance, 1.15 times the height of an eye, upper interocular distance 1.05 times the lower. Ocello-ocular line 1.5 times the postocellar line and slightly greater than the ocello-vertical line; ocello-vertical line 1.3 times the postocellar line, very slightly shorter than the third antennal segment. In front view, vertex extending beyond an imaginary line connecting the eye tops by a distance slightly greater than the length of the antennal pedicel. Scape strongly flattened, slightly curved; first four antennal segments in a ratio of about 40:8:29:28, segments 3 and 4 together equal to 0.65 times the upper interocular distance.

Pronotum 1.4 times as broad as long; collar not depressed medially; an oblique depression in front of each posterior pronotal lobe. Propodeum with several strong rugae extending forward from the spiracles; dorsal surface of propodeum with a median impression and with numerous transverse ridges which increase in height posteriorly and which are particularly prominent dorsolaterally; declivity flat, oblique, with prominent ridges on the sides which become obsolescent medially. Legs moderately spinose, the hind tibiae and basitarsus with several spines above; ultimate tarsal segments not spined beneath. Claws of all the tarsi with the tooth prominent, the apical ray strongly curved and nearly parallel to the tooth (fig. 4). Apex of abdomen weakly compressed.

Seven female paratypes vary in length from 16 to 26 mm. In some specimens the ocello-ocular line is about equal to the ocello-vertical line and the latter as much as 1.6 times the postocellar line.

MALE: Length, 12.5 mm.; forewing, 12 mm. Color of body, wings, and pubescence as in female. Scape densely hairy; entire head, thorax, and propodeum with rather dense and long dark hairs; coxae, trochanters, and femora densely hairy, tibiae slightly so; entire abdomen densely hairy, even dorsally. Head in anterior view nearly circular; transfacial distance only very slightly greater than facial distance; vertex elevated in an even arc above the eye tops. Clypeus about 1.5 times as broad as high, its apical margin convex. Middle interocular distance 0.68 times the transfacial distance; upper interocular distance 1.1 times the lower interocular distance. Ocello-ocular line 1.3 times the postocellar line. First four antennal segments in a ratio of 10:3:6:9, segment 3 1.3 times as long as thick.

Propodeum smooth, rather long, with a short, oblique declivity. Claws

of middle and hind tarsus, and outer claws of front tarsus, bifid, the inner ray subacute (fig. 5); inner claws of front tarsus slightly more curved, the inner ray rather broad, deeply separated from the outer ray. Subgenital plate (fig. 1) very long and slender, without lateral teeth, strongly keeled; ventral surface roughly haired, especially along the median ridge. Genitalia with the parameres squarely truncate, with several stout bristles on the inner margins and some smaller bristles apically; digiti club-shaped, the apex scarcely produced medially. Despite the very distinctive subgenital plate, the genitalia are not notably different from those of other species of the genus, particularly those of the *macronotum* group.

Nine male paratypes vary in length from 9 to 16 mm. and agree closely with the type in all structural details.

TYPE MATERIAL: Holotype, female, 15 kilometers east of Sombrerete, Zacatecas, about 7300 feet, July 28–31, 1951 (Evans). Allotype, male, same data as holotype. Paratypes: Two females, nine males, same data (Evans and Hurd); three females, Palos Colorados, Durango, 8000 feet, August 5, 1947 (W. J. Gertsch); one female, Coyotes, Durango, 8300 feet, August 8, 1947 (M. A. Cazier); one female, 6 miles northeast of El Salto, Durango, 8500 feet, August 10, 1947 (R. Schrammel). Holotype and allotype in the American Museum of Natural History; paratypes in the American Museum, the California Insect Survey, Cornell University, the United States National Museum, and in the collection of the author.

Psorthaspis macronotum SPECIES GROUP

In this group the vertex of the female is extended considerably above the eye tops and beyond the hind ocelli; the claws are dentate (fig. 6); the clypeo-frontal bridge is not or scarcely depressed and varies from a narrow carina to a flat-topped bridge half as wide as an antennal socket; the propodeum is moderately rugose, or the rugae may be obsolete; the hind tibiae are without spines above or with only one or two; the apical tarsal segments are spined beneath. The male has the lateral teeth of the subgenital plate strongly developed (fig. 2); the claws of the middle and hind tarsi are dentate (fig. 7). The genitalia show little variation within the group.

The following forms belong here: *macronotum* Kohl, *cressoni* Bradley, *arizonensis* Dreisbach, and two new ones, *hurdi* and *zacateca*. These five forms are very closely related, and the male genitalia and subgenital plate are virtually identical in all five. Since all appear to be allopatric, it seems logical to consider them subspecies of a single species. One other form,

nahuatlensis Bradley, known from three males from "Mexico," undoubtedly belongs here, but it is impossible to place it exactly at this time. The subgenital plate appears to be more bluntly angulate apically than in the other forms, and the body is relatively devoid of hair. It is probably best to retain it as a full species for the present, though it may prove to be another subspecies or merely worn males of one of the known subspecies. It is probable that *regalis* Smith belongs to this group also; this is known from a single female from Orizaba in addition to the type from "Mexico."

Psorthaspis regalis (Smith), new combination

Pompilus regalis SMITH, 1862, Jour. Ent., vol. 1, p. 396.

Psorthaspis banksi BRADLEY, 1944, Trans. Amer. Ent. Soc., vol. 70, p. 55. (New synonymy.)

This is a very distinctive species by virtue of having the upper margin of the head concave and the apex of the abdomen strongly compressed. In most other characters it appears to resemble *macronotum* closely, though in the absence of males it is difficult to assign it with certainty. Mr. I. H. H. Yarrow has examined the type of *regalis* in the British Museum and informs me that it keys readily to *banksi* in Bradley's keys. *Regalis* was omitted from Bradley's paper, doubtless because there is no way of identifying it as a *Psorthaspis* from the original description.

Psorthaspis macronotum macronotum (Kohl)

Pompilus macronotum KOHL, 1886, Verhandl. K. K. Zool.-Bot. Gesell. Wien, vol. 36, p. 336.

This poorly known form was described from Cuernavaca, Morelos. The following description is based on a series of females taken not far from the type locality and on a single male from a locality over 200 miles from the type locality which appears to belong here. Both sexes can be recognized by the broad, thin head and bright bluish tomentum.

FEMALE: Length, 17 (14-21) mm.; integument entirely black; pubescence of body and wings reflecting bright Prussian blue; body rather sparsely hairy, the femora not at all hairy; hind tibiae with at most one or two spines above, usually with none at all. Head distinctly broader than high, the transfacial distance about 1.05 times the facial distance. Clypeo-frontal bridge not at all depressed, round-topped opposite the bottoms of the antennal sockets. Eyes diverging very slightly above, the upper interocular distance about 1.15 times the lower interocular distance. Ocello-ocular line about 1.3 times the postocellar line; ocello-vertical line slightly less than the ocello-ocular line, slightly greater than the post-ocellar line, and about as long as the third antennal segment. In front

view, vertex extended above an imaginary line connecting the eye tops by a distance roughly twice the length of the antennal pedicel. Antennae elongate, the third segment equal to or slightly longer than the fourth, the third and fourth segments together equal to about 0.6 of the upper interocular distance. Pronotum about 1.3 times as broad as long. Propodeum with the median line lightly impressed, with moderately strong rugae on the sides of the declivity. Forewing with the third submarginal distinctly shorter both above and below than the second.

MALE: Length, 14 mm.; pubescence of body and wings strongly reflecting bluish as in the female; body with abundant erect hairs over the entire head, thorax, propodeum, abdomen, and legs to the femora, somewhat longer on the propodeum than elsewhere. Head rather thin, wider than high, the transfacial distance 1.1 times the facial distance. Clypeus rounded apically; antennae elongate, the first four segments in a ratio of about 10:3:6:9, segment 3 about 1.3 times as long as broad; middle antennal segments (5-7) each nearly twice as long as broad. Ocello-ocular line 1.2 times the postocellar line and 1.4 times the ocello-vertical line. Other body features, including the subgenital plate, very much as described for the following subspecies. Genitalia with the parameres squarely truncate apically, the digiti narrowly rounded and somewhat deflected mesad at apex.

MATERIAL EXAMINED: *Morelos*: Eleven females, Alpuyeca, June 27, 1951 (Evans and Hurd). *Jalisco*: One male, Guadalajara, July 23, 1951, on *Baccharis* (Evans). Specimens in the American Museum of Natural History, California Insect Survey, Cornell University, and the collection of the author.

Psorthaspis macronotum hurdi, new subspecies

The antennae of both sexes of this subspecies are distinctly shorter than in any of the others. The clypeo-frontal bridge is narrower than in typical *macronotum* or subspecies *zacateca*. This form resembles *arizonensis* most closely, even to the bluish green pubescence of the body and wing bases, but differs in antennal characters and in the denser and longer hair on the body of the male. It is possible that the ranges of *hurdi* and *arizonensis* will be found to meet on the west coast of Mexico.

FEMALE: Length, 15 mm.; forewing, 12 mm.; integument black; pubescence reflecting bright Prussian blue with greenish reflections; wings fuscous, violaceous, the setulae with bluish green reflections except on the apical third. Head and thorax with short, inconspicuous setae; coxae with a few short setae, the femora scarcely setose. Transfacial and facial distances equal. Clypeus 1.5 times as broad as high, its apical margin truncate. Clypeo-frontal bridge very narrow, reduced to a mere

ridge at the level of the bottoms of the antennal sockets, in profile depressed only very slightly below the level of the clypeus and of the front. Middle interocular distance 0.7 of the transfacial distance; upper interocular distance 1.2 times the lower interocular, the eyes thus diverging noticeably above. Ocello-ocular line 1.5 times the postocellar line and about equal to the ocello-vertical line. In front view, vertex extended above the eye tops about the same distance as in the typical subspecies. First four antennal segments in a ratio of 26:6:15:16, segments 3 and 4 together equal to only 0.5 of the upper interocular distance; segment 3 equal to only 0.7 the ocello-vertical line. Other characters essentially as in the nominate subspecies.

Three female paratypes vary in length from 14 to 18 mm. There are minor variations in head measurements, and in two specimens the clypeo-frontal bridge is not noticeably depressed in profile.

MALE: Length, 10.5 mm.; forewing, 8.5 mm. Pubescence of body a rich deep blue, on the dorsum suffused with purplish; wings infuscated, violaceous. Body with abundant erect dark hairs as in the nominate subspecies. Head in anterior view subcircular, the facial and transfacial distances subequal; vertex elevated in an arc above the eye tops. Clypeus 1.5 times as broad as high, its apical margin broadly rounded. Middle interocular distance 0.7 of the transfacial distance; upper interocular distance 1.25 times the lower interocular. Ocello-ocular line 1.2 times the postocellar line and nearly twice the ocello-vertical line. First four antennal segments in a ratio of 14:5:8:12, segment 3 1.2 times as long as thick; middle antennal segments (5-7) each about 1.4 times as long as their greatest thickness, the segments slightly imbricate. Characters of the terminalia not differing notably from those of other members of the *macronotum* complex.

TYPE MATERIAL: Holotype, female, Villa Guadalupe, Jalisco, about 25 kilometers north of Tepatitlán, July 26, 1951 (P. D. Hurd). Allotype, male, same data as holotype. Paratypes: Two females, same data as holotype; one female, Camino Real de Piaxtla, Sinaloa, 200 feet, May 3, 1949 (G. M. Bradt). Holotype and allotype in the American Museum of Natural History; paratypes in the American Museum and in the California Insect Survey.

Psorthaspis macronotum zacateca, new subspecies

This form is represented by a considerable series of specimens from Zacatecas, Durango, and Chihuahua; it appears to be the most common *Psorthaspis* in this part of Mexico. The female is easily recognized by the rather wide clypeo-frontal bridge.

FEMALE: Length, 21 mm.; forewing, 16 mm. Integument wholly black; wings infuscated; body and wings clothed entirely with pubescence which reflects various shades of deep blue and purple. Antennal scape, head, thorax, propodeum, and legs to the femora with fairly abundant short, dark setae; propleura and front coxae with somewhat longer hairs. Transfacial and facial distances about equal. Clypeo-frontal bridge not at all depressed, rather wide, its flattened top at the narrowest point approximately half of the width of an antennal socket. First four antennal segments in a ratio of about 35:7:24:24, segments 3 and 4 together equal to 0.6 of the upper interocular distance, segment 3 equal to 0.85 times the ocello-vertical line. Other head measurements as in *hurdi*. Pronotum 1.4 times as broad as long; propodeum moderately rugose on the sides of the declivity. Claws dentate (fig. 6); ultimate tarsal segments weakly spined beneath.

Sixteen female paratypes vary in length from 14 to 20 mm. In a few specimens the facial distance slightly exceeds the transfacial; the ocello-ocular line varies from 1.3 to 1.5 times the postocellar line and from 0.9 to 1.2 times the ocello-vertical line; the third antennal segment in several specimens is as long as the ocello-vertical distance.

MALE: Length, 12.5 mm.; forewing, 11 mm. Color of body, wings, and pubescence as in female. Scape hairy below; entire head, thorax, and propodeum with rather dense, fairly long dark hairs; coxae, trochanters, and femora strongly hairy, the tibiae slightly so; abdomen with abundant dark hairs above and below. Head in anterior view subcircular, the facial and transfacial distances subequal; vertex elevated in an even arc above the eye tops. First four antennal segments in a ratio of 9:4:6:8, segment 3 1.5 times as long as thick, middle antennal segments (5-7) each about 1.6 times as long as thick, not noticeably imbricate. Other head characters as described for *hurdi*. Propodeum with a short, abrupt declivity. Claws of middle and hind tarsus and outer claws of front tarsus dentate (fig. 7); inner claws of front tarsus bifid, the tooth short; rounded apically, deeply separated from the outer ray and more or less parallel to it. Subgenital plate as shown in figure 2. Genitalia not differing notably from those of the other subspecies; parameres truncate; digiti somewhat boot-shaped, the apex rounded, produced medially.

Sixty-eight male paratypes vary in size from 9 to 19 mm., a very considerable range. The color of the pubescence is somewhat variable, reflecting various shades of deep blue and purple. The subgenital plate shows some variation in the length of the median apical prolongation as compared to the width of the plate.

TYPE MATERIAL: Holotype, female, 15 kilometers east of Sombrerete,

Zacatecas, about 7300 feet, July 28–31, 1951 (Evans). Allotype, male, same data as holotype. Paratypes: Two females, 61 males, same locality and dates, many males on flowers of *Baccharis* growing in draw (Evans and Hurd); 10 females, three males, Nombre de Dios, Durango, August 6, 1951, several on flowers of *Asclepias* (Evans and Hurd); one male, 10 kilometers north of Nombre de Dios, on *Baccharis*, August 5, 1951 (Evans); two males, San Juan del Rio, Durango, August 7, 1951, on *Baccharis* (Hurd); one female, Pedricena, Durango, 4500 feet, August 19, 1947 (C. D. Michener); two females, 8 miles south of Canutillo, Durango, August 9, 1951 (Evans and Hurd), on flowers of *Guardiola tulocarpa*; one female, 8 miles south of Camargo, Chihuahua, August 10, 1951, on *Asclepias* (Hurd); one male, 16 miles southeast of Chihuahua, July 11, 1947 (R. Schramel). Holotype, allotype, and paratypes in the American Museum of Natural History; other paratypes in the California Insect Survey, Cornell University, the United States National Museum, Museum of Comparative Zoölogy, and the collection of the author.

Psorthaspis macronotum arizonensis Dreisbach, new status

Psorthaspis arizonensis DREISBACH, 1950, Bull. Brooklyn Ent. Soc., vol. 45, pp. 119–120.

In describing this form, Dreisbach stated that the wings possessed scales which gave a coppery refulgence, but in truth they possess no scales at all, but only the usual pubescence, which reflects bluish green (not coppery) on the basal parts of the wing. Dreisbach compares it with *avinoffi* (Banks) with which it has almost nothing in common; the latter species is known from Jamaica (not Haiti as stated by Dreisbach). I have examined a topotypic paratype of *arizonensis* (from Sonoita, not Sonofta as stated by the describer) and several other specimens of both sexes. Clearly it belongs to the *macronotum* group and is closest to *hurdi*. The antennae of the female are longer than in *hurdi*, the third and fourth segments together being equal to 0.7 of the upper interocular distance; in the male the ratio of the first four antennal segments is 18:6:10:15, segment 3 being 1.5 times as long as thick and the middle antennal segments (5–7) each about 1.8 times as long as thick. The clypeo-frontal bridge of the female is narrow, much as in *hurdi*. The femora of the male are only slightly hairy; the body hairs are for the most part rather short. The terminalia are indistinguishable from those of other members of the *macronotum* complex.

This subspecies is known only from Cochise, Pima, and Santa Cruz counties, Arizona, though it doubtless occurs in Sonora and perhaps other states of Mexico.

Psorthaspis macronotum cressoni Bradley, new status

Psorthaspis cressoni BRADLEY, 1944, Trans. Amer. Ent. Soc., vol. 70, pp. 59-60.

Psorthaspis levis BRADLEY, 1944, Trans. Amer. Ent. Soc. vol. 70, p. 43.
(New synonymy.)

This form is closely allied to the preceding, having the clypeo-frontal bridge of the female about equally developed and having the same blue-green pubescence on the bases of the wings. However, the clypeus is somewhat more squared off, the sides being nearly parallel, and the vertex more strongly produced above the eye tops. The facial distance of the female is about 1.1 times the transfacial distance; the vertex is produced above an imaginary line connecting the eye tops by a distance nearly as great as the length of the third antennal segment; the ocello-vertical distance is about 1.3 times the ocello-ocular line and nearly twice the post-ocellar line. The propodeum of the female is without transverse rugae, but in an occasional specimen they are slightly to moderately well developed. The male terminalia are much like those of the other subspecies of *macronotum*, though the parameres tend to be somewhat more clavate apically; in this sex the body hairs are mostly rather short and relatively inconspicuous, and the femora are slightly if at all hairy. The vertex of the male tends to be somewhat straight across above the eye tops, but this is a variable character, and some specimens have the vertex arched as much as in others of this species group.

The specimens of this form before me fall into two distinct size groups (females, 12-16 and 20-24 mm.), suggesting that the form may have two host species which differ in size. All the Mexican specimens that I have seen fall in the smaller size group. Bradley's *levis* appears to me to fall within the range of variation of this species and to represent the smaller size group.

MATERIAL EXAMINED: *Nuevo Leon*; Three females, 20 males, Vallecillo, June 2-5, 1951 (Evans and Hurd). Specimens in the American Museum of Natural History, California Insect Survey, Cornell University, and the collection of the author. This form is known from numerous localities in central and southern Texas.

Psorthaspis planata SPECIES GROUP

In this group the clypeo-frontal bridge of the female is very broad and flat, the flattened portion between the antennal sockets being wider than one of the sockets; the vertex is strongly produced above the eye tops. The males have all the claws bifid (fig. 8), the vertex prominently humped behind the ocellar triangle, and the subgenital plate rather simple,

with lateral basal angulations beyond which it tapers to an acute apex (fig. 3).

This group is more or less equivalent to Bradley's groups 4 and 5 combined, and includes *planata* Fox, *portiae* Rohwer, *conocephala* Bradley, *formosa* Smith, and *alternata* Banks (perhaps the male of *formosa*). These forms possess so many characters in common that it is misleading to divide them into two groups on the basis of color. Indeed, I regard *planata*, *portiae*, and *conocephala* as comprising a single superspecies extending across Mexico and southwestern United States from the Pacific to the Gulf of Mexico.

Psorthaspis planata (Fox)

Planiceps planatus FOX, 1892, Ent. News, vol. 3, p. 171.

Psorthaspis morosa BRADLEY, 1944, Trans. Amer. Ent. Soc., vol. 70, p. 42. (New synonymy.)

For further synonymy and a detailed description of this well-known species, the reader is referred to Bradley (1944). *Psorthaspis morosa* appears to me to fall within the range of variation of *planata*, although it was described from Utah, where *planata* is not otherwise known to occur. This species is known to occur in Mexico only in Baja California.

MATERIAL EXAMINED: *Baja California*: One male, 20 miles north of Mesquital, September 27, 1941 (Ross and Bohart); two males, Cedros Island, June 3, 1925 (H. H. Kiefer). Specimens in California Academy of Sciences. There are innumerable California records for this species.

Psorthaspis portiae portiae (Rohwer)

Pedinaspis (*Psorthaspis*) *portiae* ROHWER, 1920, Proc. U. S. Natl. Mus., vol. 57, p. 228.

Although *portiae* differs greatly from *planata* in color, there are no striking structural differences between these two species. The male antennae of *portiae* are somewhat more compact, and there are minor differences in the shape of the parameres and volsellae of the genitalia. Although *portiae* has previously been known only from a few females from the southwestern United States, a considerable series of both sexes is now at hand from several states of Mexico. It is apparent that the species falls into two rather well-defined subspecies, one occurring from Arizona to Zacatecas and the other in Texas and eastern Mexico. The name *portiae* applies to the western race and the name *conocephala* Bradley, described from a male from Brownsville, Texas, is available for the eastern form.

FEMALE: Upper half of head, both in front and behind, clothed with orange pubescence; side pieces of pronotum clothed almost entirely with

orange pubescence. A more detailed description of this sex has been presented by Bradley (1944).

MALE: Length, 6–9 mm. Wings completely whitish hyaline, the veins brown. Pubescence over the greater part of the body conspicuously silvery, with darker, somewhat violaceous pubescence at least on the posterior margins of the first two abdominal tergites, the first tergite often with a median line of dark pubescence; specimens from the southern part of the range often also with dark pubescence on the mesonotum, scutellum, anterior half of propodeum, and sometimes also on parts of the pronotum and mesopleura. Body with a considerable amount of erect white hair; coxae and femora hairy; front, vertex, thoracic dorsum and pleura, and propodeum with rather abundant short to fairly long white hair; abdomen with white hairs at least towards the apex.

Antennae short and compact, the middle flagellar segments only about 1.3 times as long as their greatest thickness. Vertex distinctly produced just behind the posterior ocelli. Propodeum concave posteriorly, its posterolateral angles prominent. All the claws bifid, those of the middle and hind tarsi as in figure 8; inner front tarsal claw slightly more curved than outer. Subgenital plate (fig. 3) with the sides sloping evenly from the elevated median line, the sides tapering evenly from the lateral angulations. Genitalia with the parameres truncate or slightly concave apically; digiti spatulate, a little more slender than in *planata*, the disc with minute setae.

MATERIAL EXAMINED: *Chihuahua*: One female, Salaices, July 23, 1947 (Spieth); one female, Santa Barbara, 6300 feet, July 17, 1947 (Gertsch); one male, Chihuahua, August 12, 1951, on *Baccharis* (Hurd); two males, 16 miles southeast of Chihuahua, July 11, 1947 (Schramel, Gertsch). *Durango*: Twelve females, four males, 8 miles south of Canutillo, August 9, 1951, some on *Guardiola tulocarpa* (Evans and Hurd); three females, Palos Colorados, 8000 feet, August 5, 1947 (Cazier, Gertsch, Spieth); one female, Las Puentes, 7500 feet, July 24, 1947 (Cazier); four females, two males, Nombre de Dios, August 5–6, 1951 (Evans and Hurd); two females, one male, Encino, 6200 feet, July 27, 1947 (Gertsch, Spieth, Schramel); two males, Yerbanis, Cuencame District, 6700 feet, August 19, 1947 (Cazier). *Zacatecas*: Seven males, 15 kilometers east of Sombrerete, July 28–31, 1951 (Evans and Hurd). Specimens in the American Museum of Natural History, California Insect Survey, Cornell University, and the collection of the author.

Psorthaspis portiae conocephala Bradley, new status

Psorthaspis conocephala BRADLEY, 1944, Trans. Amer. Ent. Soc., vol. 70, p. 67.

FEMALE: Pubescence of head entirely dark, or with a very limited amount of orange pubescence on the occiput; orange pubescence of pronotum extending onto the side pieces only slightly.

MALE: Body with erect white hairs only on the temples, propleura, and to a lesser extent on the front, vertex, pronotum, metanotum, and mesopleura; coxae and femora not at all hairy; abdomen with scattered erect hairs apically. Body almost entirely clothed with coarse silvery pubescence, generally absent from the posterior margins of the first two abdominal tergites. Structural features, including terminalia, not differing notably from those of the nominate subspecies.

MATERIAL EXAMINED: *Nuevo Leon*: Three males, Vallecillo, June 2-5, 1951 (Evans). This form is also known from Cameron, Bexar, Medina, and Wichita counties in Texas, and will doubtless be found to occur in Tamaulipas and Coahuila.

KEY TO MALE *Psorthaspis* INHABITING CONTINENTAL NORTH AND MIDDLE AMERICA

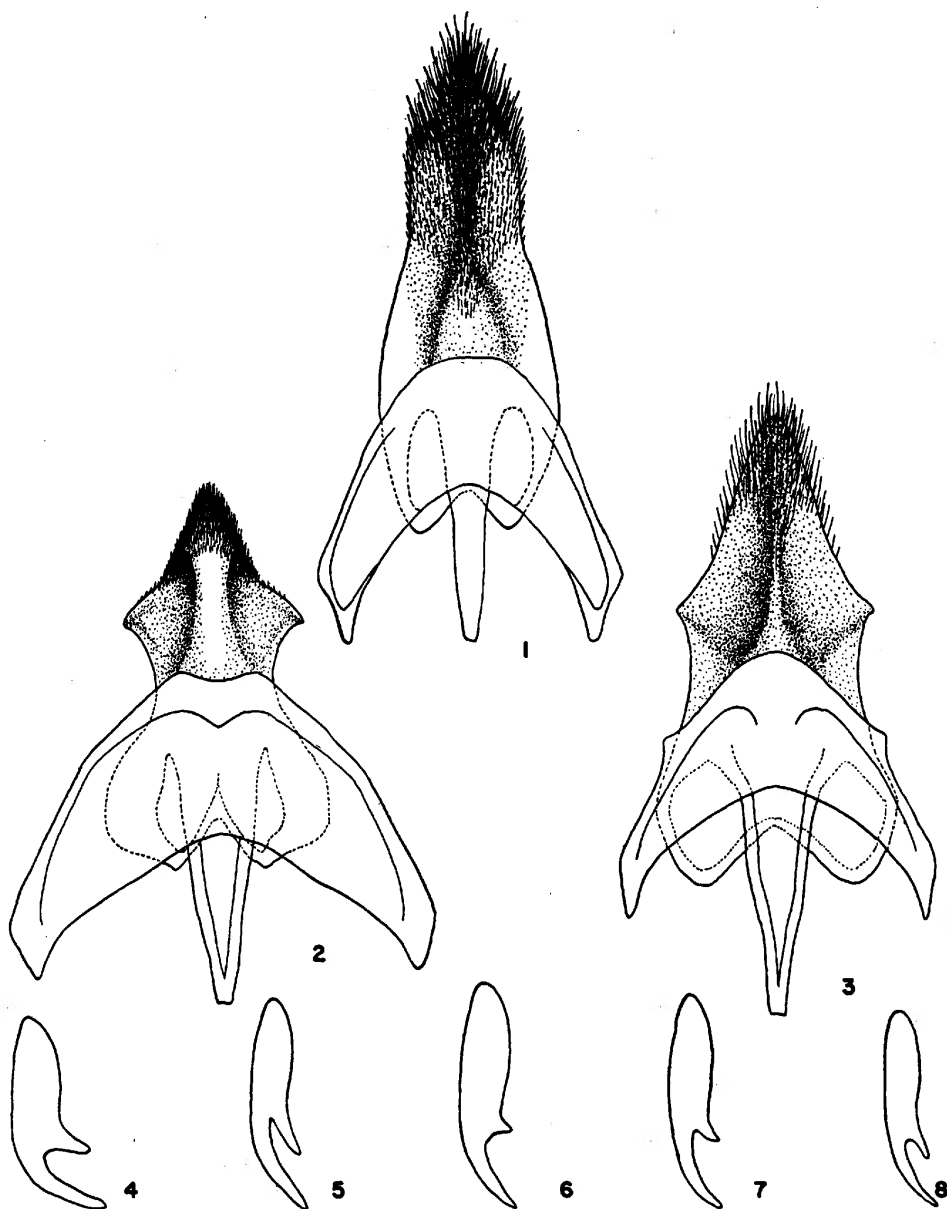
1. Wings hyaline, at least for the most part; pubescence in considerable part or wholly pale 2
 Wings wholly infuscated; pubescence predominantly or entirely dark 9
2. All claws bifid (fig. 8); vertex strongly produced behind the hind ocelli 3
 Middle and hind claws, at least, dentate (fig. 7); vertex at most slightly convex behind the ocelli 5
3. Wings infuscated at apex *alternata* (Banks)
 Wings completely hyaline 4
4. Head and thorax, including the coxae and femora, with rather abundant white hairs; pale pubescence of first abdominal tergite often divided down the middle *portiae portiae* (Rohwer)
 Head and thorax much less hairy; coxae and femora without hairs; pale pubescence of first tergite usually not divided *portiae conocephala* Bradley
5. Entire abdomen, even the basal segments dorsally, clothed with bristling white hairs which are curved at their tips; subgenital plate without lateral angulate projections *magna* (Banks)
 Abdomen never entirely clothed with white hairs of this type, though sometimes so towards the apex; subgenital plate with basal lateral angulations 6
6. Pubescence over the greater part of the thorax dark; lateral teeth of subgenital plate very prominent, the apex of the plate very slender
 *australis* (Banks)
 Pubescence over most of the thorax pale; subgenital plate with weakly developed angulate processes on each side, beyond which the sides taper gradually to the apex 7
7. Posterolateral corners of propodeum only slightly protuberant, but bearing one or more very fine longitudinal carinae (often obscured by the pubescence); spurs sometimes pale *legata* (Cresson)

- Posterolateral corners of propodeum broadly protuberant and clothed with pale setae, but without longitudinal carinae; spurs dark. 8
8. Mesosternum, coxae, and femora with numerous suberect white hairs; antennae short and compact, segments 7 through 10 each slightly longer than their greatest thickness *sanguinea* (Smith)
- Mesosternum, coxae, and femora practically without erect hairs; antennae slightly longer, segments 7 through 10 each about 1.5 times as long as thick *mariae* (Cresson)
9. Apical four abdominal tergites with very conspicuous whitish pubescence *albocaudata* (Malloch)
- Apex of abdomen without pale pubescence 10
10. All claws bifid (fig. 5); subgenital plate with weak lateral teeth or none at all (figs. 1, 3) 11
- Middle and hind claws, at least, dentate (fig. 7); subgenital plate with strong lateral basal teeth (fig. 2) 12
11. Vertex slightly to strongly elevated behind the ocellar triangle; subgenital plate with lateral angulations (as in fig. 3) *planata* (Fox)
- Vertex not elevated, forming a more or less even arc; subgenital plate slender, keeled, without lateral angulations (fig. 1) *bradleyi*, new species
12. Inner claws of front tarsi with the apical ray much more strongly curved than those of the outer claws; inner ray of inner claws very short, lobe-like *vicina* (Cresson)
- Claws of the front tarsus curved to approximately the same degree . . 13
13. Subgenital plate merely obtusely angulate apically; clypeus broadly truncate apically; body with only a small amount of erect hair *nahuatlensis* Bradley
- Subgenital plate with the apex more or less acutely produced (fig. 2); clypeus rounded or subtruncate apically 14
14. Head distinctly wider than high, the transfacial distance greater than the facial distance; head rather thin; Jalisco and Morelos *macronotum macronotum* (Kohl)
- Head not wider than high, the facial distance at least as great as the transfacial distance 15
15. Vertex, in anterior view, often nearly straight in the center, descending abruptly on the sides; body not densely hairy, the femora with a small amount of short hair if any; Texas and northeastern Mexico *macronotum cressoni* Bradley
- Vertex forming a more or less even arc from side to side; body more hairy, the femora generally conspicuously hairy 16
16. Antennae very short, the third segment only a little longer than thick, the middle antennal segments (5-7) less than 1.5 times as long as thick; Jalisco *macronotum hurdi*, new subspecies
- Antennae longer, the third segment about 1.5 times as long as thick, the middle antennal segments more than 1.5 times as long as thick . . . 17
17. Femora only moderately hairy; hairs on the thoracic dorsum scarcely any longer than the third antennal segment; Arizona *macronotum arizonensis* Dreisbach
- Femora strongly hairy; hairs on the thoracic dorsum much longer than the third antennal segment; Chihuahua to Zacatecas *macronotum zacateca*, new subspecies

KEY TO ALL-BLACK FEMALE *Psorthaspis* INHABITING
CONTINENTAL NORTH AND MIDDLE AMERICA

1. Claws sub-bifid, the tooth large, the outer ray curved in such a way as to be nearly parallel to the tooth (fig. 4) (*laevifrons* group) 2
 Claws dentate, the outer ray not curved in such a way as to be nearly parallel to the tooth (fig. 6) 6
2. Vertex extended well above the eye tops; distance between the hind ocelli and the vertex crest from 1.3 to 1.6 times the distance between the hind ocelli *bradleyi*, new species
 Vertex not extended above the eye tops; distance between hind ocelli and vertex crest not greater than the distance between the hind ocelli, or barely so 3
3. Apical margin of clypeus rounded; clypeo-frontal bridge of moderate breadth, not depressed *eubule* (Cameron)
 Apical margin of clypeus truncate; bridge narrow 4
4. Ultimate tarsal segments spined beneath; size very large (24 mm.) *coelestis* Bradley
 Ultimate tarsal segments without spines beneath; somewhat smaller species (14–20 mm.) 5
5. Clypeo-frontal bridge forming an acute ridge, not at all depressed *guatemalae* Bradley
 Clypeo-frontal bridge strongly depressed just below the antennal sockets *laevifrons* (Cresson)
6. Vertex not extended above the eye tops to any appreciable extent; clypeo-frontal bridge weakly developed, in the form of a weak carina much below the level of the clypeus or front *vicina* (Cresson)
 Vertex extended considerably above the level of the tops of the eyes; clypeo-frontal bridge well developed, slightly or not at all depressed 7
7. Clypeo-frontal bridge very broad and flat, its flat upper surface as wide as an antennal socket; hind tibiae well spined above *planata* (Fox)
 Clypeo-frontal bridge never developed as above, either very narrow or with a flattened upper surface at most half as wide as an antennal socket; hind tibiae weakly or not at all spined above (*macronotum* group) 8
8. Upper margin of head, seen from in front, deeply concave; apex of abdomen strongly compressed *regalis* (Smith)
 Upper margin of head not concave; apex of abdomen slightly if at all compressed 9
9. Head very broad, the transfacial distance greater than the facial distance; body and wings clothed with bright blue pubescence *macronotum macronotum* (Kohl)
 Head less broad, the facial distance at least as great as the transfacial distance 10
10. Propodeum without transverse rugae or almost so; clypeus almost rectangular, the sides nearly parallel; vertex extended far above eye tops *macronotum cressoni* Bradley
 Propodeum with well-developed transverse rugae, at least dorsolaterally; clypeus with the sides converging somewhat to the subtruncate apex 11
11. Clypeo-frontal bridge fairly wide, its flat upper surface about half the width of an antennal socket *macronotum zacateca*, new subspecies

- Clypeo-frontal bridge narrow, cariniform, without a flattened upper surface 12
12. Antennae rather short, the third and fourth segments together equal to about half the upper interocular distance, the third segment much shorter than the ocello-vertical distance . . . *macronotum hurdi*, new subspecies
- Antennae longer, the third and fourth segments together equal to about 0.7 of the upper interocular distance; third segment slightly if at all shorter than the ocello-vertical distance . . . *macronotum arizonensis* Dreisbach



FIGS. 1-3. Ventral view of subgenital plate. 1. *Psorthaspis bradleyi*, new species. 2. *P. macronotum zacateca*, new subspecies. 3. *P. portiae portiae* (Rohwer).

FIGS. 4-8. Hind tarsal claw. 4. *Psorthaspis bradleyi*, new species, female. 5. *P. bradleyi*, new species, male. 6. *P. macronotum zacateca*, new subspecies, female. 7. *P. macronotum zacateca*, new subspecies, male. 8. *P. portiae portiae* (Rohwer), male.

